UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/523,642	11/17/2005	Alexia Balland-Longeau	10404.026.00	1261

30827 7590 03/16/2010

MCKENNA LONG & ALDRIDGE LLP
1900 K STREET, NW
WASHINGTON, DC 20006

EXAMINER	
HEINCER, LIAM J	

ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
03/16/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/523,642	BALLAND-LONGEAU ET AL.	
	Examiner	Art Unit	
	Liam J. Heincer	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 January 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

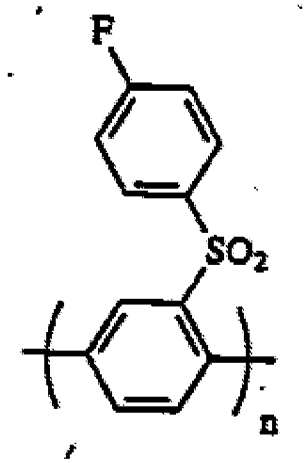
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1, 3, 4, 7, 8, 11, and 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bloom et al., (Functional Derivatives of Poly(4'-Fluoro-2,5-Diphenylsulfone via Nucleophilic Aromatic Substitution) in view of Charnock et al. (WO 01/70858).

Considering Claims 1, 3.7, 11, and 15: Bloom et al. teaches a process for producing a polymer comprising reacting a base polymer of



with a hydroxyl functional aromatic group (Scheme 1). Bloom et al. also teaches the aromatic group as containing functional groups to alter the properties of the base polymer (Conclusion). Bloom et al. teaches the substitute would be less than quantitative, thereby leaving units of the flourinated precursor (Conclusion). As Bloom et al. teaches attaching an aromatic group to the backbone through an ether linkage (Scheme 1), the polymer would contain groups of the formula W1-A-W1.

Bloom et al. does not teach the functional group as being one of the claimed acids. However, Charnock et al. teaches a sulfonated, phosphorylated, or carboxylated (5:5-10) poly-1,4-phenoxybenzoylphenylene (3:20-22, Figure 3b). Bloom et al. and Charnock et al. are combinable as they are concerned with the same field of endeavor, namely substituted poly-1,4-phenoxybenzoylphenylene. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have sulfonated, phosphorylated, or carboxylated the polymer of Bloom et al. as in Charnock et al., and the motivation to do so would have been, as Charnock et al. suggest, to provide ion exchange sites on the polymer (5:5-10).

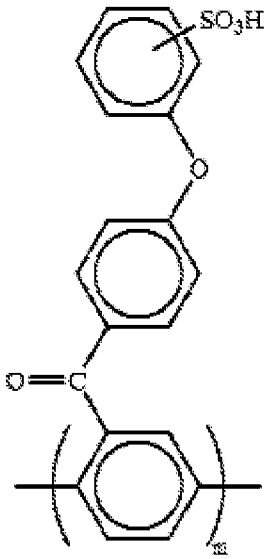
Considering Claim 4: As the nucleophilic substitution reaction would occur randomly, the polymer would be random.

Considering Claim 8: Bloom et al. teaches that the linking group between the backbone and the first aryl group can be a CO linkage (Conclusion). Bloom et al. additionally

teaches embodiments where the hydroxyl aromatic compound used in the substitution is para substituted (Scheme 1).

Claims 1-5, 7, 8 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. (US 2002/0172850) in view of Bloom and Sheares (Macromolecules 2001, 34, 1627-1633) as evidenced by Cui et al. (WO 01/42336) and Bloom et al., (Functional Derivatives of Poly(4'-Fluoro-2,5-Diphenylsulfone via Nucleophilic Aromatic Substitution). Note: US Pat. 6,790,931 is being used as an English language equivalent of WO 01/42336 and all citations will be directed towards the US document.

Considering Claim 1, 3, 7, and 8: Asano et al. teaches a polymer with a repeat unit of



(¶0033). Asano et al. teaches a polymer consisting of the repeat unit (¶0529).

Asano et al. does not teach a repeat unit of formula II. However, Bloom and Sheares teaches forming an ether substituted polybenzophenone (Conclusions) through a nucleophilic substitution between a fluorine functional polymer and a hydroxyl aromatic compound (scheme 1). As Bloom et al. shows that the substitution is not quantitative when using benzophenones (Conclusions) there would remain units with the fluorine atom attached after the reaction. Asano et al. and Bloom and Sheares are

analogous as they are concerned with the same field of endeavor, namely the formation of substituted polybenzonphenones. It would have been obvious to a person having ordinary skill in the art at the time of invention to have used the production method of Bloom and Sheares to form the polymer of Asano et al., and the motivation to do so would have been, as Bloom and Sheares suggests, the methodology allows for good control of the substitutions and improves the thermooxidative stability of the polymer (Introduction). As Cui et al. teaches that use of sulfonating agents as in Asano et al. can result in long reaction times and polymer degradation (1:34-2:38) a person having ordinary skill in the art at the time of invention would further be motivated to find reaction mechanisms avoiding the use of sulfonating agents.

Considering Claims 2 and 14: Asano et al. teaches the molecular weight as being greater than 1,500 to 200,000 (¶0432).

Considering Claim 4: Asano et al. teaches a block copolymer (¶0434).

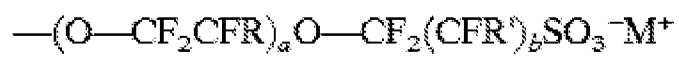
Considering Claim 5: Asano et al. teaches a two component copolymer where the sulphonated unit comprises 50 to 60 mol% of the polymer (¶0027).

Considering Claims 12 and 13: Asano et al. teaches the use of the polymer as membrane for use in a fuel cell (¶0002).

Claims 6, 9, and 10 rejected under 35 U.S.C. 103(a) as being unpatentable over Asano et al. (US 2002/0172850) in view of Bloom and Sheares (Macromolecules 2001, 34, 1627-1633) as evidenced by Cui et al. (WO 01/42336) and Bloom et al., (Functional Derivatives of Poly(4'-Fluoro-2,5-Diphenylsulfone via Nucleophilic Aromatic Substitution) as applied to claim 1 above, and further in view of Doyle et al. (US Pat. 6,025,092).

Considering Claims 6, 9, and 10: Asano et al. and Bloom and Sheares collectively teach the polymer of claim 1 as shown above.

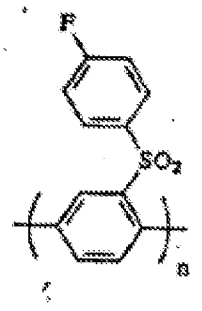
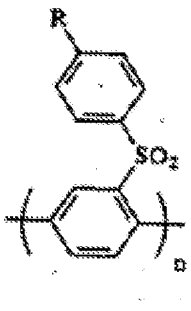
Asano et al. does not teach the pendant acid as being of the claimed type. However, Doyle et al. teaches using a pendant group of



in an ion exchange membrane (2:46-55). Asano et al. and Doyle et al. are combinable as they are concerned with the same field of endeavor, namely ion exchange membranes. It would have been obvious to a person having ordinary skill in the art at the time of the invention to have used the pendant group of Doyle et al. in the place of the sulphonic acid of Asano et al., and the motivation to do so would have been, as Asano et al. suggest, the excellent proton conductivity of the perfluoronated polymer electrolytes (¶0005).

Response to Arguments

Applicant's arguments filed January 11, 2010 have been fully considered but they are not persuasive, because:

A) The applicant's argument that Bloom et al. teaches a polymer having only one repeat unit is not persuasive. Bloom et al. teaches the substitute would be less than quantitative, thereby leaving units of the flourinated precursor (Conclusion). Therefore, the final product would contain units of both  and  . These units, when modified as suggested by Charnock et al. are the claimed units (II) and (I) respectively.

B) In response to applicant's argument that Bloom et al. and Charnock et al. are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443

(Fed. Cir. 1992). In this case, Bloom et al. and Charnock et al. are combinable as they are concerned with the same field of endeavor, namely substituted poly-1,4-phenoxybenzoylphenylene. Although the two references are not directed towards the same final end use, both references are concerned with methods of attaching substituents to poly-1,4-phenoxybenzoylphenylene, and thus the teachings of each would be reasonably pertinent to the other.

C) In response to applicant's argument that Charnock et al. does not teach where the substituent is placed on the polymer backbone, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Bloom et al. teaches that the substituent is located on the nucleophile that is attached to the polymer backbone (Scheme 1). This is the same location as in the instant claims.

D) In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a composition consisting of the claimed polymer) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The claims are directed towards a polymer consisting of certain repeat units, rather than a composition. Additionally, as Asano et al. teaches a polymer that is made prior to mixing with the second polymer (¶0529-31), the reference teaches a composition comprising only the substituted phenoxybenzoyl-1,4-phenylene) polymer.

E) In response to applicant's argument that Asano et al. and Bloom are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443

(Fed. Cir. 1992). In this case, Asano et al. and Bloom and Sheares are analogous as they are concerned with the same field of endeavor, namely the formation of substituted polybenzonphenones.. Although the two references are not directed towards the same final end use, both references are concerned with methods of attaching substituents to poly-1,4-phenoxybenzoylphenylene, and thus the teachings of each would be reasonably pertinent to the other.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Liam J. Heincer whose telephone number is 571-270-3297. The examiner can normally be reached on Monday thru Friday 7:30 to 5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Eashoo can be reached on 571-272-1197. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Mark Eashoo/
Supervisory Patent Examiner, Art Unit 1796

LJH
March 8, 2010